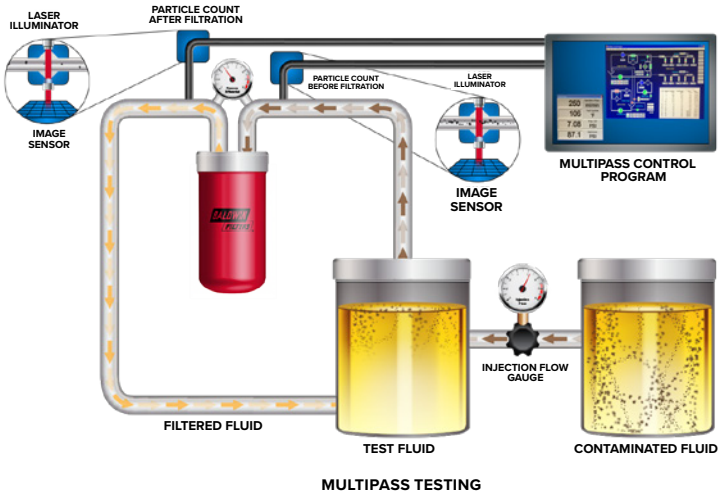
TECH TIPS
LIQUID FILTER TESTING BASICS

Understanding Liquid Filter Performance

Baldwin filters are put through extensive tests to ensure they will protect your equipment as well or better than the OE filter. To accurately understand and compare filter performance, one must understand the basics of filter testing.

Liquid Filter Tests

The filtration industry uses standardized test methods to enable “apples to apples” comparison of filters regardless of where they are tested. For liquid filters, multi-pass tests are done by adding a defined amount of calibrated test dust to a tank of standard test fluid. Over the course of the test, this contaminated liquid passes through the filter multiple times.



MULTIPASS TESTING

Two most common measurements of liquid filter performance:

- **Capacity** refers to ***how much*** contaminant a filter can hold. It is important in helping to determine how long a filter will last before it needs to be replaced.

  When a filter reaches a predefined restriction level (i.e. pressure differential or psid), its capacity can be calculated by subtracting the amount of contaminant remaining in the test fluid after filtration from the amount originally introduced. The balance has been successfully captured and held inside the filter.

- **Efficiency** refers to ***how well*** a filter removes contaminants. It gives you an idea of how much protection the filter will provide to your equipment.

  The filter's efficiency can be determined by measuring the amount of contaminant in the fluid before (upstream) and after (downstream) filtration. Using specially calibrated test dust enables the measurement of efficiencies at different particle sizes. At the end of the test, when testing particles at a specified micron size, the filter is:

  - **50% Efficient** if 50% of particles are still in the test fluid
  - **90% Efficient** if 10% of particles are still in the test fluid

Micron Rating

A filter that does a great job catching large 50 micron particles may allow virtually all smaller particles to pass through. Therefore, in order to make sense, efficiency ratings must include both the amount and size of contaminant removed.

A filter that removes half of all contaminants 10 microns and larger is 50% efficient at 10 microns. It is said to have a “nominal” efficiency rating of 10 microns.

A filter that removes 98.7% (or more) of all contaminants 5 microns and larger is traditionally said to have an “absolute” rating of 5 microns.

Sometimes “nominal” or “absolute” ratings do not provide specific enough information for a particular application. Sophisticated modern fuel systems, for example, require nearly 100% of even the smallest contaminants to be removed before diesel reaches the injector. It is not uncommon to see a “Tier IV” final fuel filter rated 99.99% efficient down to 4 microns or below.